WHAT IS CLAIMED IS:

1. An electromagnetic drive motor, comprising:

a flux return assembly including:

an upper pole piece; and

a lower pole piece;

a flux stabilization ring around the upper and lower pole pieces and coupling the upper and lower pole pieces;

a top plate;

a bottom plate;

a magnet in between the top and bottom plates;

a top magnetic gap between the flux return assembly and the top plate; and

a bottom magnetic gap between the flux return assembly and the bottom plate.

2. An electromagnetic drive motor according to claim 1, wherein the flux return assembly is within the top and bottom plates, the flux return assembly having a hole along a centerline.

3. An electromagnetic drive motor according to claim 1, wherein the top and bottom plates are within the flux return assembly.

4. An electromagnetic drive motor according to claim 2, wherein both the upper and lower pole pieces have an exterior side and an inner side, the inner sides of both the upper and lower pole pieces juxtaposed to each other, wherein the combined upper and lower pole pieces assembly define an outer wall and an inner wall of the flux return assembly, wherein the flux return assembly has a smaller outer diameter along the inner side than the exterior side defining a recess about the inner side of the flux return assembly.

5. An electromagnetic drive motor according to claim 4, wherein the flux stabilization ring has a smaller inner diameter than the outer diameter of the flux return assembly along the inner side, wherein the flux stabilization ring wraps around the recess of the flux return assembly.

6. An electromagnetic drive motor according to claim 2, further including:
a first voice coil;
a second voice coil;
a cylinder, the first and second coils wound around the cylinder; and
wherein the cylinder is disposed in the top and bottom magnetic gaps.

7. An electromagnetic drive motor according to claim 6, wherein the first voice coil is juxtaposed to the top plate and the second voice coil is juxtaposed to the bottom plate.

8. An electromagnetic drive motor according to claim 6, wherein the first and second coils are coupled to each other externally from the cylinder and to a pair of terminals.

9. An electromagnetic drive motor according to claim 2, wherein the top plate has a top plate tip juxtaposed to the upper pole piece facing towards the bottom plate, and the bottom plate has a bottom plate tip juxtaposed to the lower pole piece facing towards the top plate.

10. An electromagnetic drive motor according to claim 2, wherein the top plate has a top plate tip juxtaposed to the upper pole piece facing away from the bottom plate, and the bottom plate has a bottom plate tip juxtaposed to the lower pole piece facing away from the top plate.

11. An electromagnetic drive motor according to claim 2, wherein the top plate has a top plate tip juxtaposed to the upper pole piece that faces towards and away from the bottom plate, and the bottom plate has a bottom plate tip juxtaposed to the lower pole piece that faces towards and away from the top plate.

12. An electromagnetic drive motor according to claim 9, wherein the top and bottom plates each have a cavity near the top plate tip and bottom plate tip, respectively.

13. An electromagnetic drive motor according to claim 2, wherein the upper pole piece has a upper pole tip juxtaposed to the top plate, and the bottom pole piece has a lower pole tip juxtaposed to the bottom plate.

14. An electromagnetic drive motor according to claim 2, wherein the upper and lower pole pieces are symmetrical.

15. An electromagnetic drive motor according to claim 2, further includes an intermediate gap between the top and bottom magnetic gaps, an outer flux stabilization ring in between the magnet and the flux stabilization ring, wherein the intermediate gap is between the outer flux stabilization ring and the flux stabilization ring.

16. An electromagnetic drive motor according to claim 2, wherein the flux return assembly is made of aluminum.

17. An electromagnetic drive motor according to claim 2, wherein the electromagnetic drive motor is enclosed in a housing.

18. An electromagnetic drive motor according to claim 2, wherein the magnet is an assembly of three layers of magnets.

19. An electromagnetic drive motor according to claim 1, wherein the top plate has an increased saturation area juxtaposed to the top magnetic gap, wherein the saturation area has a maximum level of magnetic field strength from about 10,000 Gauss to about 22,000 Gauss.

20. An electromagnetic drive motor according to claim 1, wherein the upper pole piece has an increased saturation area juxtaposed to the top magnetic gap, wherein the saturation area of the upper pole piece has a maximum level of magnetic field strength from about 10,000 Gauss to about 22,000 Gauss.

SUB B1

21. An electromagnetic drive motor, comprising:

a flux return;

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~~a top plate;~~

~~a bottom plate;~~

~~a magnet in between the top and bottom plates;~~

~~a top magnetic gap between the flux return assembly and the top plate; and~~

~~a bottom magnetic gap between the flux return assembly and the bottom plate.~~

22. An electromagnetic drive motor according to claim 21, wherein the flux return is within the top and bottom plates.

23. An electromagnetic drive motor according to claim 21, wherein the top and bottom plates are within the flux return.

24. An electromagnetic drive motor according to claim 21, wherein the top plate near the top magnetic gap is saturated to a maximum level of magnetic field strength from about 10,000 Gauss to about 22,000 Gauss.

25. An electromagnetic drive motor according to claim 21, wherein the top and bottom plates near the corresponding magnetic gaps are saturated to a maximum level of magnetic field strength from about 10,000 Gauss to about 22,000 Gauss.

26. An electromagnetic drive motor according to claim 21, wherein the flux return near the top and bottom magnetic gaps are saturated to a maximum level of magnetic field strength from about 10,000 Gauss to about 22,000 Gauss.

27. An electromagnetic drive motor according to claim 21, wherein the top plate has a top plate tip juxtaposed to the top magnetic gap facing towards the bottom plate, and the bottom plate has a bottom plate tip juxtaposed to the bottom magnetic gap facing towards the top plate.

28. An electromagnetic drive motor according to claim 21, wherein the top plate has a top plate tip juxtaposed to the top magnetic gap facing away from the bottom plate, and the bottom plate has a bottom plate tip juxtaposed to the bottom magnetic gap facing away from the top plate.

29. An electromagnetic drive motor according to claim 21, wherein the flux return has a upper pole tip juxtaposed to the top magnetic gap and a lower pole tip juxtaposed to the bottom magnetic gap.

30. An electromagnetic drive motor according to claim 21, wherein the electromagnetic drive motor has a centerline, wherein along the centerline is a hole.

31. a thermal radiating conductive ring (TRCR), comprising:

an inner ring;

an outer ring; and

a plurality of bridges between the inner and outer rings, wherein in between the plurality of bridges are openings; and

a magnetic material in each of the openings.

32. A TRCR according to claim 31, wherein the electromagnetic drive motor is enclosed in a housing.

33. A TRCR according to claim 31, wherein the outer ring of the TRCR forms an outer wall that is exposed to atmosphere.

34. A TRCR according to claim 31, wherein the bridge has a bridge height and the inner and outer rings has a ring height, wherein the bridge height is less than the ring height.

35. A TRCR according to claim 31, wherein the bridge has a bridge height and the inner and outer rings has a ring height, wherein the bridge height is substantially same as the ring height.

36. A TRCR according to claim 34, wherein the bridge is located approximately along the center of the ring height.

37. A TRCR according to claim 31, further including an inner flux stabilization ring around the inner flux return.

38. A TRCR according to claim 31, wherein a continuous gap is formed between the magnetic material and the TRCR.

39. A TRCR according to claim 31, wherein the plurality of bridges are four bridges defining four openings.

40. A TRCR according to claim 31, wherein the magnetic material is a bonded magnetic material.

41. A TRCR according to claim 40, wherein the bonded magnetic material is filled within the openings.

42. A TRCR according to claim 31, wherein the TRCR is between a top plate and a bottom plate.

43. A TRCR according to claim 31, including an inner flux return within the inner ring of the TRCR.

44. A method for forming an inner flux return, comprising the steps of:

providing an upper pole piece configured to be a ring, the upper pole piece having an exterior side, an inner side, an outer wall, and an inner wall, the diameter of the outer wall along the inner side being smaller than the diameter along the exterior side;

providing a lower pole piece substantially similar to the upper pole piece;

providing a flux stabilization ring between the upper and lower pole pieces, wherein the inner diameter of the flux stabilization ring is smaller than the diameter of the outer wall along the inner side of the pole pieces; and

pressing the inner side of the upper pole piece to the inner side of the lower pole piece, wherein the flux stabilization ring holds the upper and lower pole pieces substantially together.

45. A method according to claim 44, further including the steps of:

laying a layer of adhesive between the inner sides of the upper and lower pole pieces.

46. A method according to claim 44, further including the steps of:

saturating the upper and lower pole pieces near the exterior sides and the outer walls of the upper and lower pole pieces.

47. A method according to claim 44, further including the steps of:

laying a layer of adhesive between the inner side of the flux stabilization ring and outer diameter along the inner sides of the upper and lower pole pieces.

48. A method according to claim 46, wherein the saturation of the magnetic field strength is from about 10,000 Gauss to about 22,000 Gauss.

49. A method for minimizing the modulation in the magnetic gap of an electromagnetic drive motor, comprising the steps of:

saturating a top plate near a top magnetic gap;

saturating a bottom plate near a bottom magnetic gap; and

providing a flux return, wherein the top and bottom magnetic gaps are between the flux return and the top and bottom plates.

50. A method according to claim 49, further including the steps of:

saturating the flux return near the top and bottom magnetic gaps.

51. A method according to claim 50, wherein the flux return is within the top and bottom plates.

52. A method according to claim 49, further including the steps of:

using finite element analysis to design the top and bottom plates to operate below the saturation point based on a predetermined flux lines running through the top and bottom plates.

53. A method according to claim 49, further including the steps of:

saturating the top and bottom plates to a maximum level of magnetic field strength from about 10,000 Gauss to about 22,000 Gauss.

54. A method according to claim 53, wherein the maximum level of magnetic field strength is from about 17,000 Gauss to about 20,000 Gauss.

55. A method according to claim 49, further including the steps of:

saturating the flux return near the top and bottom magnetic gaps to a maximum level of magnetic field strength from about 10,000 Gauss to about 22,000 Gauss.

56. A method according to claim 49, wherein the saturation of the top plate is done by providing a smaller cross-sectional area to squeeze the magnetic field in the smaller cross-sectional area in the top plate adjacent to the top magnetic gap; and

saturation of the bottom plates is done by providing a smaller cross-sectional area to squeeze the magnetic field in the smaller cross-sectional area in the bottom plate adjacent to the bottom magnetic gap.

57. A method according to claim 54, wherein the saturation of the flux return near the top and bottom magnetic gaps are done by providing smaller cross-sectional areas near the top and bottom magnetic gaps respectively to squeeze the magnetic field through the smaller cross-sectional areas near the top and bottom magnetic gaps.

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58. A method for increasing the magnetic flux lines running through a magnetic gap of an electromagnetic drive motor, comprising the steps of:

providing a top and bottom plates juxtaposed to respective top and bottom magnetic gaps within an electromagnetic drive motor;

providing more surface area in the top plate juxtaposed to the top magnetic gap; and

providing more surface area in the bottom plate juxtaposed to the bottom magnetic gap.

A1 Cont

59. A method according to claim 58, further comprising the steps of:

providing an flux return, wherein the top and bottom magnetic gaps are between the flux return and the top and bottom plates; and

providing more surface area in the flux return juxtaposed to the top and bottom magnetic gaps.

60. A method according to claim 58, wherein more surface area is provided in the top plate by a top plate tip and more surface area is provided in the bottom plate by a bottom plate tip, wherein the top and bottom plate tips face towards each other.

61. A method according to claim 60, wherein between the top and bottom magnetic gap is an intermediate gap, wherein the top and bottom plate tip substantially extends across the intermediate area but not so much that a magnetic short circuit is created between the top and bottom plate tips.

62. A method according to claim 59, wherein more surface area in the flux return near the top and bottom magnetic gaps are created by a top pole tip and a bottom pole tip.

63. A method for transferring heat away from a magnetic gap and an intermediate gap in an electromagnetic drive motor, comprising the steps of:

providing an inner ring juxtaposed to a intermediate gap; and

conducting the heat from the inner ring directly to an outer ring.

64. A method according to claim 63, wherein the outer ring is an outer wall of a housing.

65. A method according to claim 63, wherein the inner and outer rings are made of aluminum.

66. A method according to claim 63, wherein the heat from the inner ring is directly conducted away to the outer ring by a plurality of bridges defining a plurality of openings.

67. A method according to claim 66, wherein the plurality of bridges are four bridges.

68. A method according to claim 66, wherein the plurality of bridges have a height and the inner and outer rings have a height, wherein the height of the bridge is less than the height of the inner and outer rings.

69. A method according to claim 66, wherein the plurality of bridges have a height and the inner and outer rings have a height, wherein the height of the bridge is substantially same as the height of the inner and outer rings.

70. A method for manufacturing a magnet for an electromagnetic drive motor that efficiently conduct heat away from magnetic and intermediate gaps, comprising the steps of:

providing a thermal radiating conductive ring (TRCR), including:

an inner ring;

an outer ring; and

a plurality of bridges between the inner and outer rings, wherein in between the plurality of bridges are openings; and

filling the openings with a magnetic material.

71. A method according to claim 70, wherein the magnetic material is a bonded permanent magnetic material, wherein the bonded permanent material includes a base magnetic material and a binder material.

72. A method according to claim 71, wherein the base magnetic material is a material selected from the group consisting of: ceramic, Neodymium, and Alnico.

73. A method according to claim 71, wherein the binder material is a material selected from the group consisting of: Nylon, Nitrile, Polyethylene, and Thermoplastics.

74. A method according to claim 70, wherein the plurality of bridges have a height and the inner and outer rings have a height, wherein the height of the bridge is less than the height of the inner and outer rings.

75. A method according to claim 70, wherein the plurality of bridges have a height and the inner and outer rings have a height, wherein the height of the bridge is substantially same as the height of the inner and outer rings.

76. A method according to claim 75, further including the step of:

extruding the TRCR having the inner and outer rings, and the bridges; and

cutting the TRCR to a predetermined length equal to the height of the inner and outer rings, and the height of the bridges.